

Report

Trends in mortality from chronic obstructive airways disease in the United Kingdom

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Chronic bronchitis, the so called English disease, has been declining as a cause of death throughout this century in all age groups and for both sexes. Recently concern has been expressed among epidemiologists that in Britain this rapidly declining mortality has suffered a setback: the trend has been reversed and the already substantial burden of chronic obstructive airways disease is going to get worse. This view is echoed in many other countries, including the United States. The culprit is "chronic airways obstruction," a concept first devised in 1959 at a Ciba symposium¹ in an attempt to clarify the confusion over terminology, and now a well established clinical term. It has been reported that, although the number of deaths attributed to chronic bronchitis continues to decline, this is counterbalanced by the considerable increase in deaths classified as chronic airways obstruction.² This has led to an actual increase in the total number of deaths due to chronic obstructive airways disease. This is undoubtedly true, but, at a time when the age structure of the population is rapidly changing, it is the age specific mortality rates that are important.

This paper seeks to establish both the current and the long term trends through an analysis of age specific mortality over 90 years. Terminology remains a problem and, for the purposes of this paper, ICD/9 496 will be referred to as chronic airways obstruction, and bronchitis (chronic and unqualified), emphysema, and chronic airways obstruction (ICD/9 490-492 and 496) will be referred to collectively as chronic obstructive airways disease. Chronic obstructive pulmonary disease describes those conditions coded ICD/9 490-496.

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Method

Analysis has taken two forms. Firstly, cohort analysis describes the mortality experience of successive generations. By comparison of the age specific mortality rates for bronchitis, asthma, and emphysema in groups born at around the same time, it is possible to detect trends and, further, identify influences to which all or some members of the group have been exposed that may explain that mortality.³ Over the period investigated there have been eight revisions of the International Classification of Diseases and the ICD codes used under each revision are set out in the table. The complexity of the changes in classification for bronchitis, asthma, and emphysema over the years is such that the only way to achieve continuity is to combine all three diseases. Included since 1979 are deaths from chronic airways obstruction (ICD/9 code 496), which were omitted in a previous cohort analysis.⁴

The second part of the analysis presents recent trends in mortality for bronchitis, emphysema, and chronic airways obstruction. Age specific mortality rates have been obtained for both sexes for ages 45-84 years. Although chronic airways obstruction was allocated a four figure code in the ICD eighth revision (519.8), separate data are available only for 1978, so it

ICD codes covering bronchitis, emphysema, asthma, chronic obstructive pulmonary disease, and since 1975 chronic airflow obstruction

ICD revision	ICD code
2nd revision	89-90, 96, 97
3rd revision (1920)	99b,c,d, 105, 106
4th revision (1929)	106b,c,d, 112, 113
5th revision (1938)	106b,c,d, 112, 113
6th revision (1948)	501-502, 241, 527
7th revision (1955)	501-502, 241, 527.1
8th revision (1965)	490-493
9th revision (1975)	490-493, 496

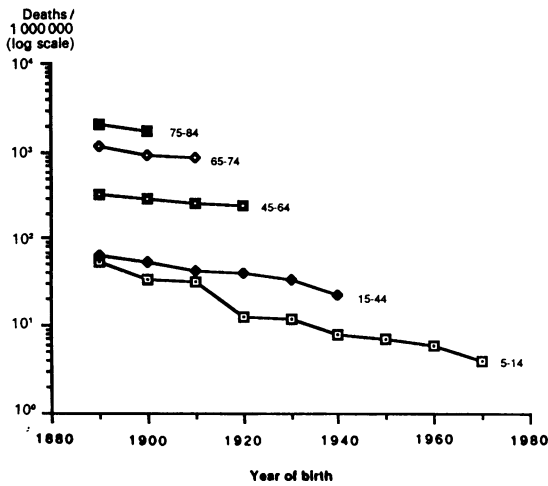


Fig 1 Age specific cohort mortality for bronchitis, asthma, and emphysema: females, England and Wales, ages 5-84 years.

was decided for clarity to concentrate on the years since the introduction of the ninth revision, 1979-86. The ICD codes used are 490-492 and 496. All data were obtained from published mortality statistics.⁵

Results

The results of the birth cohort analysis are presented in figures 1 and 2. As expected, the mortality rates for males are far higher than those for females, particularly in the older age groups. At ages 65-84 years in all the cohorts studied rates for men are around five

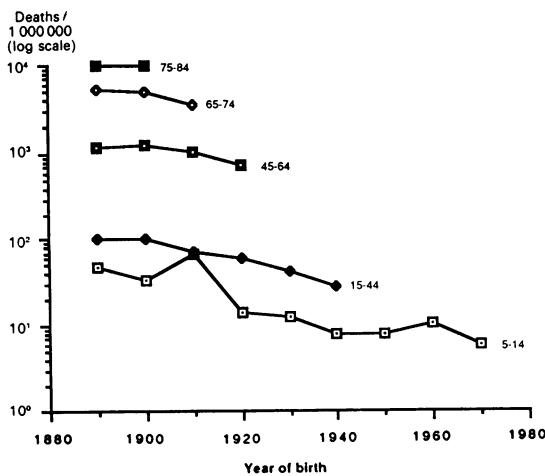


Fig 2 Age specific cohort mortality for bronchitis, asthma, and emphysema: males, England and Wales, ages 5-84 years.

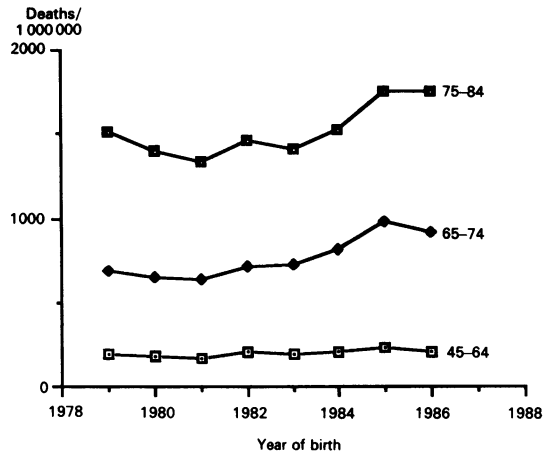


Fig 3 Age specific mortality for bronchitis, emphysema and chronic airways obstruction (ICD codes 490-492, 496): females, England and Wales, ages 45-84 years.

times higher than those for women. At all ages and for both sexes the trend is downwards, though less so for men in the age group 75-84 years. The mortality rate for women of 65-74 years born in 1881-99 is 1158 per million population; for those born in 1901-19 the rate is 866 per million, a reduction of 25%. For men in the same age group and born in the same two periods the reduction in mortality is 33%. In the 75-84 year group the decline is less dramatic. For women the decline in

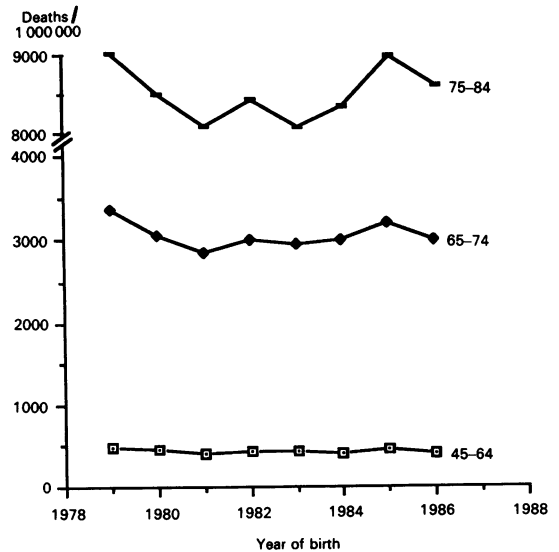


Fig 4 Age specific mortality for bronchitis, emphysema, and chronic airways obstruction (ICD codes 490-492, 496): males, England and Wales, ages 45-84 years.

mortality from the 1881–99 to the 1891–1909 fifth cohort is 14% and for men under 2%.

Recent trends in mortality from bronchitis, emphysema, and chronic airways obstruction for ages 45–84 are presented in figures 3 and 4. Of immediate note is the contrast in trend between men and women, particularly in the older age groups. For women over 65 the trend is upwards, most notably since 1983. For men, though the annual fluctuation is greater than for women, there has been a slight decline in mortality over the period under consideration. For example, in 1979 the mortality rate per million population for ages 65–74 was 3367; in 1986 this figure was 3004. The equivalent rates for the age group 75–84 are 9027 and 8614. It is interesting to observe an increase in the proportion of deaths classified under chronic airways obstruction in the number of deaths recorded for chronic obstructive pulmonary disease (ICD 490–496). In 1979 76% of deaths were classified as “bronchitis, chronic and unqualified” (ICD 490–491), and only 11% as chronic airways obstruction” (ICD 496). By 1985 chronic airways obstruction was accounting for 45% of the deaths recorded for this group of diseases. This contrasts with the data from the United States. In 1985 only 5% of deaths were coded as “bronchitis,” compared with 71% coded as 494–496, of which by far the largest slice was accounted for by chronic airways obstruction (M Feinleib, personal communication).

These results partially contradict suggestions that the United Kingdom's experience is similar to that of the United States. Although the rapid increase in mortality from bronchitis, emphysema, and chronic airways obstruction in women since 1979 is similar to the increase in the United States, the pattern among men is different. The trend over here is downwards, whereas the American trend has been rising, albeit at a slower rate than for women. The cohort analysis has shown the long term trend downwards in mortality for both sexes and at all ages in the United Kingdom, in direct contrast to a reported steady increase since 1950 in the United States (M Feinleib; TJ Thom, personal communications). As in the United Kingdom, results from a recent investigation into chronic obstructive lung disease mortality in Canada emphasised the different experiences of men and women. Among men the steep increase in mortality since 1954 has recently begun to level off, whereas among women the steady increase since 1960 is continuing.⁶

Discussion

The difficulties inherent in the interpretation of cause specific mortality trends over time are well known. Greater knowledge of the pathology of disease, improved diagnostic facilities, and changing termin-

ology and coding systems may all distort real trends in incidence and mortality.⁷ It is, therefore, important to be aware of factors that may have an impact on the validity of trends to ensure that detected changes are not artefactual.

International variations in certification and coding practices are well documented.^{8,9} Reid and Rose found that, in an international sample of doctors asked to “certify” causes of death in a series of case histories according to their normal practice, British doctors were more likely to classify a death as due to chronic bronchitis than their Norwegian or American counterparts. Clinicians in the United States have always regarded bronchitis as a less severe condition than their British colleagues, preferring instead to diagnose emphysema or bronchiectasis.¹⁰ This international confusion over terminology has been clarified to some extent in recent years, but is by no means completely resolved.^{11,12} Fletcher points out that where the diagnosis of disease is defined according to loss of function there will inevitably be disagreement until consensus can be reached on the limits of normality. This consensus has still apparently not been reached, so confusion over diagnosis and hence certification persists.

These considerations of the impact of certification practice on international differences are relevant to within country variation over time. The most obvious reason for changing diagnostic and certification practice over time is current thinking among clinicians, both throughout the period of medical education and at the time of practising. The rapidly changing distribution of cause of death within the category chronic obstructive airways disease suggests a current fashion for chronic airways obstruction. The increasing number of deaths taking place in hospital also has an impact. Kelson and Heller found a difference in certification practice between hospital doctors and general practitioners in England and Wales.¹³ If fewer deaths are being certified by general practitioners this could influence the trends in published mortality rates.

The period under review, as already mentioned, encompasses eight revisions of the International Classification of Diseases, and inevitably the categories in each successive revision do not wholly correspond to those of the previous one. Comparability therefore is only approximate. This problem is further compounded by the exclusion, until the ninth revision, of chronic airways obstruction within the categories of bronchitis, asthma, and emphysema. In the eighth revision chronic airways obstruction was classified under “Other diseases of the respiratory system” (ICD 519). Once it became apparent that this was a growing category, chronic airways obstruction was allocated its own four digit code, 519.8, but separate data are available only for 1978. Before then the data on which

the analysis is based are not comprehensive, though the proportion of deaths allocated to chronic airways obstruction before the late 1970s is likely to have been small.

The second part of our analysis—the monitoring of recent trends since the introduction of ICD 9—does not suffer from these limitations in the data. Yet even within this time period coding changes have been made that have had an important effect. After an investigation into the apparent increase in deaths from pneumonia, it was decided to alter the coding rules for certain conditions, including bronchopneumonia.^{14,15} The upshot of this was a substantial alteration in the proportions of deaths assigned to different respiratory disease codings between 1983 and 1984. An analysis of the change in distribution of deaths due to the implementation of the new rules shows that over one third of the annual increase in deaths classified as chronic airways obstruction (ICD 496) in 1984 would formerly have been assigned to other categories, outside the group ICD 490–496.¹⁶ This explains the notable “jump” in the number of deaths from chronic airways obstruction between 1983 and 1984.

In the wake of these observations, it is tempting to conclude that the current vogue for chronic airways obstruction and the complex changes in the coding system have contributed more to the apparent reversal of a declining mortality trend than any actual change. Any artefactual explanation, however, would operate with equal force for both sexes, and the mortality of men and women would be similar.¹¹ The fact that this is not the case suggests that the upward trend among older women, at least in part, is real. Of all the risk factors identified and investigated for chronic bronchitis, by far the most important is smoking.^{17,18} It is therefore plausible that the difference in mortality patterns between men and women reflects their differing smoking habits, the decline in smoking being far slower among women. Recent UK statistics show that the proportion of women over 60 who smoke cigarettes has barely changed during 1979–85, unlike all other adult groups.⁹ This does not augur well for the pattern of disease among the older age groups, and it is important to monitor what could become an important health problem in women.

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